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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

STAHL, MICHAEL J

ART UNIT PAPER NUMBER

2874

DATE MAILED: 06/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/772,929

Applicant(s)

LIN ET AL.

Examiner

Mike Stahl

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☒ Claim(s) 9, 12 and 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

***Claim Objections***

Claim 9 is objected to because "Claimb 1" should be "Claim 1".

Claims 12 and 13 are objected to because it appears that they should depend from claim 11 rather than claim 1.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 9, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Tabuchi (US 5611006).

Claim 1: Tabuchi discloses a bidirectional transceiver module based on a silicon optical bench in fig. 8A (certain elements are shown in fig. 2 because of the perspective), the module including: an optical fiber **23**; a laser diode **20** which emits optical output signals of a specific wavelength to be propagated by the fiber; a signal detector **22** which receives optical input signals from the fiber; a thin film filter **18** between the laser diode or the signal detector and the fiber, for reflecting or inserting the optical input or output signals of a specific wavelength in order to change the light transmission path of the signals (see col. 9 lns. 37-42); an optical lens **16d** (or **16b**) between the laser diode and the fiber for improving light coupling efficiency; a groove **42** for guiding the optical output signal to the fiber, or guiding the optical input signal to the signal detector; and a silicon optical bench made of a silicon wafer **11**, the silicon optical

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bench integrating the fiber, laser diode, signal detector, thin film filter, lens, and groove into a module using a packaging. See particularly figs. 8A and 2-4, and the associated description.

Claim 2: The packaging is a passive alignment packaging (grooves 17, 19, and 24 provide passive alignment in the embodiment described above).

Claim 9: Lens 16 is a ball lens.

Claim 15: The groove 42 is V-shaped with a flat bottom (best seen in fig. 12A).

Claims 1-2 and 11-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Tu (US 6219470).

Claim 1: Tu discloses a bidirectional transceiver module based on a silicon optical bench in fig. 3, the module including: an optical fiber 312; a laser diode 307 which emits optical output signals of a specific wavelength to be propagated by the fiber; a signal detector 310 which receives optical input signals from the fiber; a thin film filter 303 between the laser diode or the signal detector and the fiber, for reflecting or inserting the optical input or output signals of a specific wavelength in order to change the light transmission path of the signals; an optical lens 309 between the laser diode and the fiber for improving light coupling efficiency; a groove 302b for guiding the optical output signal to the fiber, or guiding the optical input signal to the signal detector; and a silicon optical bench 301 made of a silicon wafer, the silicon optical bench integrating the fiber, laser diode, signal detector, thin film filter, lens, and groove into a module using a packaging. See particularly figs. 3 and 8A-8C, and the associated description.

Claim 2: The packaging is a passive alignment packaging (see e.g. col. 2 lns. 50-63).

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Claim 11: The bottom of the groove **302b** near the signal detector **310** is a slant surface for reflecting the optical input signal upward (col. 3 lns. 50-53; col. 4 lns. 10-14).

Claim 12: The receiving surface of the signal detector is downward.

Claim 13: In an alternate embodiment, the slant surface at the bottom of the groove near the signal detector is coated with a thin film of highly reflective metal (see element **412** of fig. 8B, which corresponds to element **304** of fig. 3, and col. 6 lns. 19-21).

Claim 14: The groove **302b** is V-shaped (col. 4 lns. 36-40).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claims 3-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabuchi (cited above).

Claims 3-8 and 10: Tabuchi discloses spherical lenses. However, the various types of lenses recited in claims 3-8 and 10 are also well known to persons of ordinary skill in the art. Each type has a recognized advantage. For example, a straight-cut flat tip fiber is easy to make; a slant-cut flat tip fiber can reduce undesirable back-reflection of signals if the slant face is about 6-8 degrees from perpendicular to the fiber axis; conic, arch, and thermally expanded core fibers are all formed integrally with a fiber and provide a focusing function without requiring attachment of a separate refractive element; a gradient index lens provides a focusing function and can be made simply from a commercially available gradient index optical fiber; and an aspheric lens can convert the shape of the beam emitted from a laser diode (which is often elliptical) to a circular shape which better matches the shape of the fiber core. All these types of lenses may be readily incorporated into the Tabuchi device. Accordingly it would have been obvious to a skilled person at the time the invention was made to have used any well known type of lens in the Tabuchi device in order to achieve one of these recognized advantages. It is noted that the present specification merely enumerates possible types of lenses, but does not describe any criticality or unexpected advantages for any of them.

Claims 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tu (cited above).

Claims 15-19: Tu discloses V-shaped grooves, but not the variants recited by claims 15-19. It is noted that Tu mentions various ways of forming grooves including anisotropic etching,

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laser ablation, and dicing saw cutting. It would have been obvious to a person having ordinary skill in the art to have manufactured the Tu device with any appropriate shape for the groove. As to the particular recited groove shapes, it has been held that a mere change in shape or form is obvious if the change does not result in a new function or provide an unexpected result (e.g., In re Hanlon, 128 USPQ 384). In the present case, each differently shaped groove has the same function as the V-shaped groove in Tu, i.e., to allow passage of light, and the present specification does not describe any criticality or unexpected advantages associated with any of the given shapes.

### ***Conclusion***

The additional references cited on the attached PTO-892 form are considered relevant to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Stahl at 571-272-2360. Inquiries of a general or clerical nature (e.g., a request for a missing form or paper, etc.) should be directed to the technical support staff supervisor at 571-272-1626. Official communications which are eligible for submission by facsimile and which pertain to this application may be faxed to 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

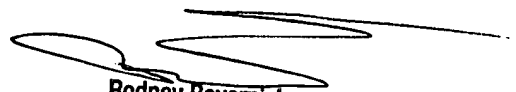
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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MSS

Mike Stahl  
Patent Examiner  
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May 26, 2005



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